UNIT-2

Unit-2 Group Theory — Discrete — Shubhangi Sharma
B. TECH
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## Binary Operations

- Let $G$ be a nonempty set. Then $G \times G = \{(a,b) : a \in G \text{ and } b \in G\}$
- If $f : G \times G \to G$, then $f$ is said to be binary operation on $G$.
- Thus a binary operation on $G$ is a function that assign each ordered pairs of elements of $G$ an element of $G$.
- The symbols $+, \cdot, 0, *$ etc. are used to denote binary operations on a set. Thus $+$ will be a binary operation on $G$ if and only if

$a+b \in G$ for all $a, b \in G$ and $a+b$ is unique.

Similarly,

$*$ will be a binary